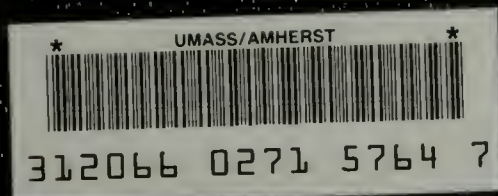


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ANNUAL REPORT
to the
MASSACHUSETTS WATER RESOURCES COMMISSION
by the
Director and Chief Engineer
Division of Water Resources
for the
Fiscal Year Ending - June 30, 1981

PUBLICATION: #12529-150-17-9-81-CR
Approved by John J. Manton, State Purchasing Agent

INTRODUCTION

Chapter 21, Section 8 of the General Laws of the Commonwealth, enacted in 1956, established the existence, the duties and the jurisdiction of a Water Resources Commission under whose supervision and control would be the Division of Water Resources. Subsequently, in 1966, Chapter 685 established a Division of Water Pollution Control as the second operating agency of the Commission. Most recently, Chapter 511 of the Acts of 1980 placed that Division under the general supervision, control, and oversight of the Commissioner of Environmental Quality Engineering. The Commission retains an advisory role. The current make-up of the Commission was instituted pursuant to Chapter 706, of the Acts of 1975, which extensively amended Chapter 21.

The mandates were clear. The Commission was charged with the responsibility for the study of the needs, supplies and resources of the Commonwealth with respect to private and public use of water, water conservation and flood damage prevention.

This report intends to summarize the progress by the Division of Water Resources during Fiscal Year 1981, in response to those mandates.

Supervisory responsibility for the Division is incorporated in the following individuals who constitute the Water Resources Commission as of June 30, 1981.

Co-Chairman - William F. M. Hicks, Commissioner
Department of Environmental Management

Co-Chairman - Anthony D. Cortese, Commissioner
Department of Environmental
Quality Engineering

Department of Food & Agriculture Representative
Frederick Winthrop, Jr., Commissioner

Designee: Warren Colby, Assistant Commissioner
Department of Food & Agriculture

Department of Commerce & Development Representative
Ernest Lucci, Commissioner

Designee: Laurie Siegel
Department of Commerce & Development

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Department of Fisheries, Wildlife & Recreation Vehicles Representative
Stephen Chmura, Commissioner

Designee: Robert Austin
Department of Fisheries, Wildlife & Recreational
Vehicles

Department of Metropolitan District Commission Representative
Terence J. Geohegan, Commissioner

Designee: Julia O'Brien
Metropolitan District Commission

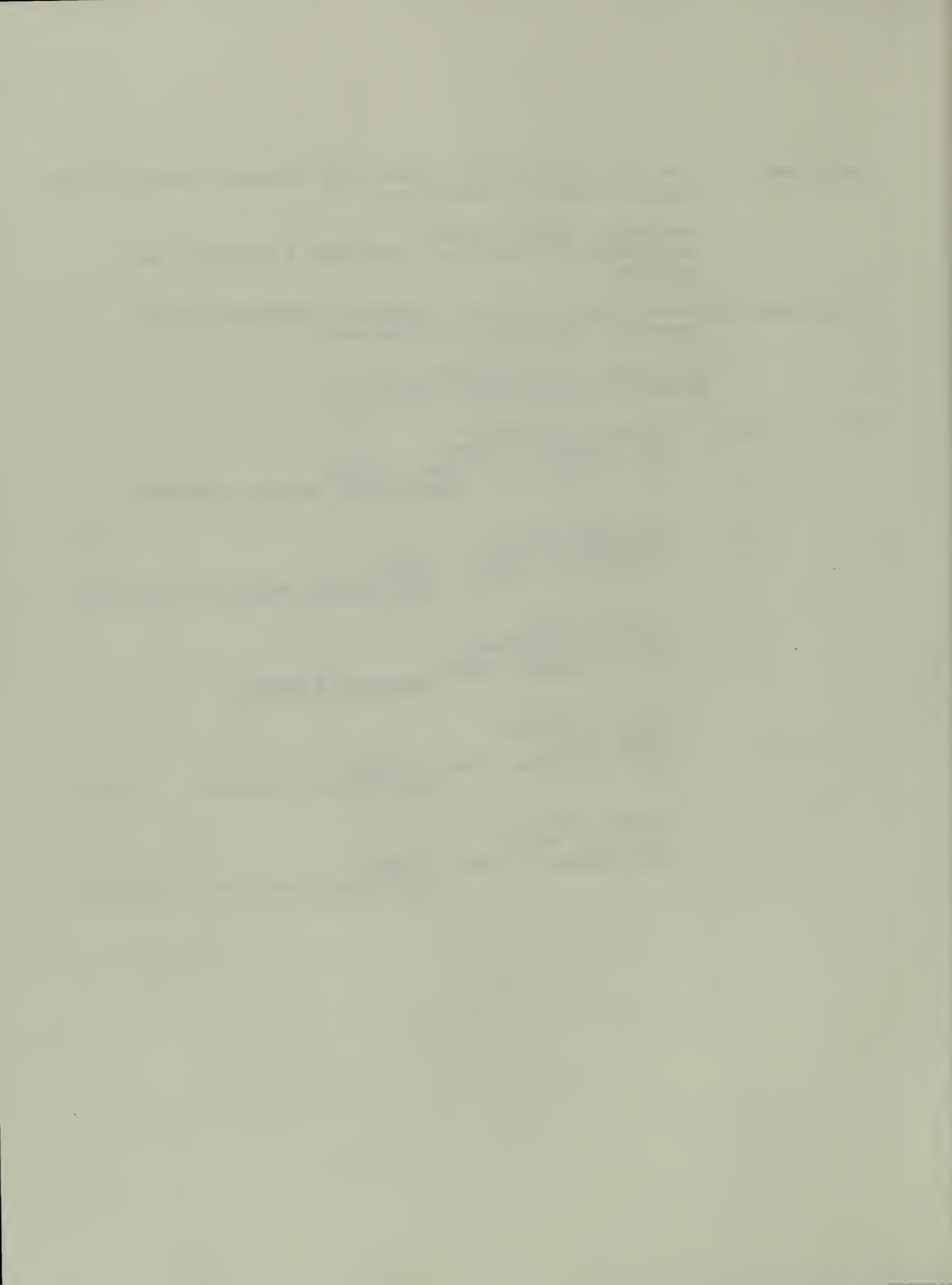
Public Members - Peter C. Karalekas
322 Prospect Street
East Longmeadow, Mass., 01028
Appointment expires 11/29/83

Rita Barron
76 Walden Street
Newtonville, Mass., 02160
Appointment expires - 11/29/81

Richard Noss
106 Centre Street
Milton, Mass., 02188
Resigned 6/25/80

Richard Chapman
Hobbs Road
East Princeton, Mass., 01517
Appointment expires - 7/31/81

Nathan Tufts, Jr.
101 River Road
Merrimacport, Mass., 01860
Appointment expires - 12/15/81



PERSONNEL OF THE DIVISION (as of June 30, 1981)*

Kennedy, Charles F.	Director & Chief Engineer
Pyle, O. Fletcher	Associate Civil Engineer
Beshara, Michael L.	Associate Civil Engineer
Maguire, Kevin B.	Senior Civil Engineer
Struzziero, Ernest J.	Senior Civil Engineer
Thibedeau, Richard H.	Chief Planner
Grice, David	Principal Planner
Bones, William F., Jr.	Resources Planner
Ostrowski, Mary F.	Resources Planner
Phippen, Peter D.	Resources Planner
Shapiro, Sheldon	Associate Environmentalist (Wetlands Restriction)
Krol, William A.	Principal Civil Engineer (Wetlands Restriction)
Brown, David	Senior Marine Fisheries Biologist (Wetlands Restriction)
Hayward, David F.	Principal-Right-of-Way Agent (Wetlands Restriction)
Humphries, Stanley	Land Use Administrator (Wetlands Restriction)
Levine, Nathan R.	Senior Civil Engineering Draftsman (Wetlands Restriction)
Brosnahan, Helen R.	Principal Clerk
Tanzer, Philip	Senior Statistical Clerk
Dewey, Doris	Junior Clerk Typist
O'Keefe, Kellie	Junior Clerk Typist

**Although the Division funded various positions in the Wetlands Restriction Program, as shown on this page, the Annual Report for that program will be prepared by the Director of that Division.

ADMINISTRATIVE APPROPRIATIONS

<u>Fiscal Year</u>	<u>Appropriations</u>
1976	\$ 262,155
1977	345,000
1978	379,152
1979	300,218
1980	* 339,360
1981	* 353,200

In addition, the following sums were appropriated for the operation of Interstate Flood Control Commissions.

Connecticut River Valley Flood Control Commission) \$107,960
Merrimack River Valley Flood Control Commission)

These funds were used for the payment of the Commonwealth's share of operating the respective Flood Control Commissions and the annual tax and economic losses to the upstream states caused by the construction of flood control reservoirs.

Other Major Appropriations:

P.L. 566 Maintenance	\$ 50,000
Federal Cooperative Studies	158,000
New England River Basins Commission	48,500
Ipswich River Watershed District	1,000

TOTAL BUDGET APPROPRIATION

<u>Fiscal Year</u>	<u>Appropriation</u>
1981	\$718,660

* Includes Administration, Water Planning and Flood Control

Regional Interstate Comprehensive Water and Related Land Resources Planning

Interstate studies involved the Commonwealth, other state and federal agencies during the fiscal year. Generally, these studies are under the leadership of the New England River Basin Commission (NERBC) or the New England Division of the U.S. Army Corps of Engineers (COE).

The Section 73 study in the Connecticut River Basin is designed to evaluate the potential role of non-structural flood management methods. NERBC is conducting the study in cooperation with COE and the U.S. Soil Conservation Service (SCS). The Corps published a study report dealing with the feasibility of non-structural damage reduction in Northampton, Massachusetts, in January 1981. Basically, the study concluded that a non-structural plan per se was not warranted at the time. As part of the study, each building owner within the 100 year flood plain received an evaluation of how their property might be affected by the 50, 100, and 500 year floods. COE recommended that the town rely, to a great extent, on flood warning and evacuation programs.

A final report of the Corps' Pawcatuck River-Narragansett Bay Study will include a second look at the Brockton Water supply situation. This report, being completed by a consultant for the Corps should be out this year.

The U.S. Corps of Engineers' Housatonic Urban Study focuses on flooding, water supply and recreational issues. The Division's participation includes assisting in the coordination of the study with the USDA's River Basin Planning Program for The Upper Housatonic. Much progress was made on the water supply feasibility portion of the study which considers development of surface water, ground water, regional supplies, and water conservation. The 100 year flood plain of the Housatonic River has been defined by mapping to identify structures in the flood plain. Flood damage areas and non-structural hazard reduction alternatives are being evaluated. A first draft of the study is planned for January 1982.

Reports, Publications and Documents, FY1981

Mass. Division of Water Resources, F.Y. 1980 Annual Report To The United States Water Resources Council, Boston, 1981.

New England River Basins Commission (with participation by the Division of Water Resources), Housatonic River Basin Overview, Boston, September 1980.

U.S. Army, Corps of Engineers, New England Division, by Coffin & Richardson, Inc., Abandoned or Reserve Water Supplies, Metropolitan District Commission Service Area, Boston, 1980

U. S. Geological Survey in cooperation with Massachusetts Water Resources Commission, HA-589, Hydrology and Water Resources of The North Shore, Ipswich, and the Mystic River, Boston, 1980.

U.S. Geological Survey in cooperation with Massachusetts Water Resources Commission, HA-614, Hydrology and Water Resources of The Shawsheen River Basin, Massachusetts, Boston, Mass., 1980

U.S. Geological Survey in cooperation with the Water Resources Commission, HA-615, Water Resources of Nantucket Island, Massachusetts, Boston, 1980.

U.S. Geological Survey in cooperation with The Water Resources Commission, HA-616, Hydrology and Water Resources of The Lower Merrimack River Basin, Massachusetts, From Concord River, Lowell, to Plum Island, Newburyport, Boston, 1980.

U.S. Geological Survey in cooperation with The Massachusetts Water Resources Commission, HA-618, Hydrology and Water Resources of Martha's Vineyard, Massachusetts, Boston, 1980

U.S. Geological Survey in cooperation with The Massachusetts Water Resources Commission, Hydrologic Data Report #20, Hydrologic Data of the Coastal Drainage Basins of Southeastern Massachusetts, Northwest Shore of Buzzards Bay, Boston, 1980.

U.S. Geological Survey in cooperation with The Massachusetts Water Resources Commission, Hydrologic Data Report #21, Hydrologic Data of The Coastal Drainage Basins of Northeastern Massachusetts, From Castle Neck River, Ipswich, to Mystic River, Boston, 1980.

U.S. Geological Survey in cooperation with the Massachusetts Water Resources Commission, Open File Report 80-1205, Probable High Groundwater Levels in Massachusetts, Boston, 1980.

U. S. Geological Survey in cooperation with The Massachusetts Water Resources Commission, Open File Report 80-1008, Probable High Ground-Water Levels on Cape Cod, Massachusetts, Boston, 1980.

U.S. Geological Survey in cooperation with the states of

Massachusetts and Rhode Island, Water Data Report MA-RI- 79-1,
Water Resources Data for Massachusetts and Rhode Island, Boston,
1980.

U.S. Department of Agriculture in cooperation with The
Massachusetts Water Resources Commission, Massachusetts Agricul-
tural Water Quality Study, Working Paper No. 2, Amherst, 1981.

U.S. Soil Conservation Service, (Preliminary Draft)
Massachusetts River Basin Planning Program, Supplement #4, Water
Resources and Priority Study, Amherst, 1981.

Water Resources Data Interchange

One of the most important services of the Division of Water Resources is the dissemination of basic data and other water resources information to professionals, other resource planning agencies and the general public. The Division responds to an average of fifteen telephone and three mail requests for information per week.

STATE PLANNING AND ACCOMPLISHMENTS

State water planning activities are in the following categories: basic data acquisition, regional resources evaluations and level B or C studies, led by the New England River Basins Commission or federal agencies.

Basic Data Gathering includes the recording of precipitation, stream gaging, snow surveys and flood monitoring. This information is necessary for detailed water supply and flood control planning. The Commission continues to operate a system of 199 rainfall stations. Statistical records are maintained on general weather conditions such as the rainfall records in the appendix of this report for calendar year 1980. This service is valuable to engineers, students, architects, climatologists and the legal profession. The Commission also maintains logs of water wells drilled throughout the state pursuant to the requirements of M.G.L., Chapter 21, Section 16.

Regional Resource Evaluations may be based on watersheds, groups of watersheds or groups of towns. The following are applicable current studies or programs:

Section 22 Study

In connection with the Water Resources Commission's Drought

Management Task Force, the COE under authority of Section 22, PL 93-251, completed a study of public water supply interconnections, except to the Metropolitan District Commission, throughout the Commonwealth. The study report consists of a map and a computerized compilation of the data obtained.

Massachusetts River Basin Planning Program (MRBPP)

A Division member serves on the Technical Advisory Committee (SCS) and attends work group meetings for the two active planning programs which are in the Upper Housatonic and North/South River Basins. The initial review draft of the North/South rivers' report is nearing completion. The next draft will be for public review. Inventories except for water quality, which is continuing, were completed for the Upper Housatonic River Basin. Work is progressing on analysis and evaluation. The Division of Water Resources is the coordinating agency for state input into these studies.

Neponset River Basin Study (Flood Plain Management)

Phase II of this study has been completed by the U.S. Corps of Engineers. The report, which will contain some excellent color photography of the Neponset, is expected to conclude that no further federal action is warranted.

"Atlas Program" - Ground Water Studies

Work continued during FY 1981 on basinwide studies to describe the quality and quantity of the ground and surface water resources in the Sudbury-Assabet-Concord (SUASCO), French-Quinebaug and Chicopee River basins. This program is funded jointly by the U.S. Geological Survey and the Water Resources Commission. Studies were completed and printed for Nantucket Island, the Lower Merrimack River Basin and Martha's Vineyard.

Water Supply Alternatives for the City of Pittsfield

As directed by Chapter 20 of the Resolves of 1979, the Water Resources Commission is conducting a study of the alternatives for augmenting the water supply for the city of Pittsfield. The Division of Water Resources helped to develop the scope of work, organized and chaired a committee consisting of local and state representatives to review and evaluate proposals to assist the Commission in consultant selection, and is monitoring the work in progress.

Early Acquisition of Reservoir Sites Program

The Water Resources Commission is authorized by the Legislature pursuant to Chapter 21, Section 9A, M.G.L., to acquire land

or water and easements which are needed to protect future water resource values and conserve impoundment sites for the purposes of flood control, low flow augmentation and/or regional water supply.

Accomplishments during FY 1981 included:

a.) developing criteria and evaluation guidelines to determine the order of priority of requests from communities for funds to acquire reservoir sites for municipal water supply.

b.) developing a detailed nomination (application) form to assist communities applying for funds to document conformance with the established criteria.

c.) distributing nomination forms to communities with a public water supply system and the evaluation of three applications using in part the information obtained from the water supply element information received from the towns.

d.) pre-planning for the creation of a selection committee to review nominations and to make recommendations to the Water Resources Commission.

Eastern Metropolitan Water Supply Alternatives Study

Building upon the recommendations of the Connecticut Level B Study and the Southeastern New England Level B Study, a comprehensive study was initiated by a member agency of the Water Resources Commission, the Metropolitan District Commission, to evaluate the alternative solutions to meeting the water supply needs of the eastern metropolitan area. The study will encompass the water use demand and supply alternatives for 256 communities located east of the Connecticut River (excluding Cape Cod and the islands) as well as Hartford, Middletown and Enfield in Connecticut for water needs for the years 1990, 2000 and 2020.

Accomplishments during this period included:

1.) finalizing the scope of service for the study and the negotiation and signing of the contract with the consultant with work beginning in March, 1980.

2.) conducting a literature search to establish whether existing information was adequate to address the major issues raised by each alternative, to identify gaps in this baseline information and to recommend any work needed to fill the gaps. This effort was summarized in the consultant's report entitled, "Findings of Literature Review and Recommendations for Further Study", and in a more detailed 466 page report, "Phase I Basic Services Technical Memoranda Appendix".

3.) developing a proposal of methods of analysis and a recommended scope for an Environmental Impact Report for the Massachusetts Environmental Policy Act review process.

4.) The Division of Water Resources participated in this study by:

a. providing the consultant and the citizens' advisory committee basic water resources data:

b. reviewing drafts of the material produced.

(P.L. 566 Watershed Protection and Flood Prevention Act Program

I. Operational Watersheds

1. Clam River - Berkshire County

All structures are complete except the Clam Lake Site, where a solution to an erosion problem with a portion of the embankment is being pursued. Structural corrections have also been made to the riser which controls the water level of the lake.

2. Washington Mountain Brook - Berkshire County

The Environmental Impact Study for the project was redrafted and submitted to the Secretary of Environmental Affairs under the auspices of the Water Resources Commission. A relocation easement agreement has been signed by the Governor to permit relocation of the telephone cable right-of-way located on the Washington Mountain Lake Site.

3. West Branch, Westfield Basin - Berkshire and Hampden Counties.

The entire project is under review.

4. Quaboag River - Worcester County

Work is progressing satisfactorily on the Moose Hill Reservoir Site where the dam is nearing completion. The relief wells are being installed, and the Moose Hill Road relocation is nearly completed. The Division continues to work with the Town of Spencer to determine the best method for dredging of Sugden Reservoir.

5. SuAsCo - Middlesex and Worcester Counties

The final site in this watershed has been

completed except for landscaping. The dam construction has been approved and a contract for the landscaping will be awarded in the near future.

6. Baiting Brook - Middlesex County

The final E.I.S. for the project was completed and printed. The project is ready to move ahead as soon as the town of Framingham appropriates their share of the funds.

7. Diamond Brook - Norfolk County

Work was completed on the Allen Site project located on Diamond Brook in Walpole. The final inspection was held and the project was accepted in May, 1981.

II. Planning Phase

1. Ten Mile River - Bristol and Norfolk Counties

The plan of work has been completed and a start has been made on the Watershed Work Plan for this project.

OTHER STUDIES AND PROGRAMS

Water Resources Planning Regulations (313:CMR 2.00)

The Division's planning staff made a major effort to obtain compliance from the cities and towns with respect to the Water Supply Element which is Phase I of the management planning process. At the end of FY 1981, Elements had been received from 97 percent of the Commonwealth's cities and towns. Much of this success was due to the addition of two new people to the Division's planning staff. A draft Basin Water Supply Summary framework is being reviewed. Division staff are now reviewing the Water Supply Elements completed by the towns, districts and water companies for their acceptability and conformance to the regulations. In many cases it will be necessary to contact agencies for further information. In fiscal year 1982 the Division will be preparing Basin Water Supply Reports for the 27 river basins.

National Water Use Data Program

This program is designed to collect, store and disseminate basic water use and related data for use in planning and management decisions involving water resources. The position assigned full time to this cooperative program with the U.S. Geological

Survey has been filled and it is expected that early in FY 1982 another full time position will be created. Upon the completion of the preliminary conceptual design, the project management plan and the preliminary data element dictionary, the focus on FY 82 will be on the development of a pilot program. This will be concerned with only one important functional water use, namely public water supply. In FY 1981 a pilot program work plan was developed, an inventory of existing public water supply data collection programs in DEM, DEQE, and MDC was completed and an investigation into the technical (computer) system development for the pilot was initiated. Plans for FY 1982 also include the actual collection and storage of water use data in an automated system.

Chapter 800, Acts of 1979

This was the first year of a long term cooperative U.S. Geological Survey/Water Resources Commission program designed to provide baseline data on major aquifers in the Commonwealth. These comprehensive assessments will identify areal extent, depth, hydrologic characteristics, the quality and quantity of water, and the effect of water use alternatives. Two (2) basins have been selected for initial work. The Central Connecticut River Valley Aquifer Study and The Mattapoissett River Valley Aquifer Project commenced this fiscal year. For the Connecticut Study, the U.S. Geological Survey has begun a review of groundwater data, preparation of base maps, and specifications for an exploratory drilling contract.

In the Mattapoissett River Basin an existing well data inventory is being made and a water level network is being established. Monthly measurements of water levels are being taken.

Ground Water Steering Committee Program (GWSC)

The Division continued active participation in the work of the GWSC, a technical arm of the Water Resources Commission.

During the Fiscal Year 1981 a ground water protection policy was presented to the Commission and approved. The implementation program is in formation, including delineation of all named stream sub-basins statewide, selection of a classification system for protection priority, and public education and participation program design.

National Flood Insurance Program

The Division of Water Resources (DWR) as the state coordinating agency cooperating with the Federal Emergency Management

Administration (FEMA) continued its efforts in fostering participation by Massachusetts communities in the program. Priorities were established for the rating studies and the Division monitors the consultants' work in progress. The Division also assisted FEMA in the distribution of the completed maps and reports. Storage space is provided.

Of the participating communities in the Commonwealth, 156 are in the Regular Program and 163 are in the Emergency Program. Four (4) communities are suspended from the program for their failure to adopt required land use measures.

In FY 1981 and 1982, the Division is expanding this program. One new employee was assigned to the Program as a start in improving the Commonwealth's capabilities to respond to flood emergencies and to provide assistance to local governments.

MASSACHUSETTS PRECIPITATION 1980
(Inches)

	State	Northeast Section	Southeast Section	Central Section	Conn. River Section	Western Section
January	0.87	0.71	1.78	1.04	0.94	0.54
February	1.08	0.91	1.28	1.08	1.17	0.98
March	6.82	5.44	6.79	7.83	7.91	7.28
April	4.52	4.57	4.73	5.37	5.18	4.57
May	1.66	1.75	1.21	2.21	2.00	1.69
June	4.01	3.52	3.45	4.18	4.22	4.56
July	3.69	3.80	2.19	4.20	4.43	3.20
August	1.92	1.48	2.01	2.11	1.89	2.43
September	1.57	1.39	0.98	1.70	2.52	2.26
October	4.03	4.80	5.34	4.83	3.13	3.45
November	3.81	3.27	4.10	4.13	3.67	3.58
December	1.36	0.73	2.12	0.94	1.28	1.84
Year	35.34	32.37	35.98	39.62	38.34	36.38
Normal	43.99	42.61	44.72	44.53	44.90	45.19

MASSACHUSETTS PRECIPITATION 1980
DEVIATION FROM NORMAL
(Inches)

	State	Northeast Section	Southeast Section	Central Section	Conn. River Section	Western Section
January	-2.86	-3.01	-2.27	-2.84	-2.52	-2.75
February	-2.14	-2.47	-2.34	-2.38	-1.93	-1.90
March	+3.00	+1.66	+2.66	+3.81	+4.24	+3.94
April	+0.91	+0.99	+0.79	+1.68	+1.59	+0.90
May	-1.94	-1.58	-2.27	-1.29	-2.00	-2.29
June	+0.54	+0.22	+0.24	+0.55	+0.29	+0.41
July	+0.03	+0.36	-0.78	+0.71	+0.30	-1.21
August	-2.09	-2.19	-2.12	-1.62	-2.23	-1.95
September	-2.10	-2.17	-2.75	-2.10	-1.26	-1.96
October	+0.49	+1.52	+1.80	+1.49	-0.37	+0.01
November	-0.05	-0.61	+0.32	+0.10	-0.27	-0.24
December	-2.44	-2.96	-2.02	-3.02	-2.40	-1.77
Total Excess of Deficiency for Year	-8.65	-10.24	-8.74	-4.91	-6.56	-8.81

